Chang-Meng B. Hsiung et al.
Application No.: 09/802,512

In the Claims:

Please add new claims 33-51 as follows. Original claims 1-32 are unchanged by this preliminary amendment.

1.   (Original) A system for monitoring an industrial process, the system comprising;

a process controller; an input module coupled to the process controller, the input module being adapted to input a plurality of parameters from a process for manufacture of a substance;

a computer aided process module coupled to the process controller, the computer aided process module being adapted to compare at least two of the plurality of parameters against a predetermined training set of parameters, and being adapted to determine if the at least two of the plurality of parameters are within a predetermined range of the training set of parameters; and

an output module coupled to the process controller, the output module being adapted to output a result based upon the determining step.

2.   (Original) The system of claim 1 wherein the substance is selected from a petroleum product, a chemical product, a food product, a health product, a cleaning product, a biological product, and other fluid or objects.

3.   (Original) The system of claim 1 wherein the plurality of parameters are selected from an intrinsic element or an extrinsic element of the process.

4.   (Original) The system of claim 1 wherein the input module, the computer aided process module, and the output module are provided in a computer software program.

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5. (Original) The system of claim 1 wherein the computer aided process includes an algorithm selected from PCA, HCA, KNN CV KNN Prd, SIMCA CV, SIMCA Prd, Canon Prd, SCREAM, and Fisher CV.

6. (Original) The system of claim 1 further comprising a normalizing module coupled to the process controller, the normalizing module being adapted to normalize each of the plurality of parameters before input into the computer aided process module.

7. (Original) The system of claim 1 wherein the training step of parameters are preprocessed in at least two of the computer aided processes.

8. (Original) The system of claim 1 wherein the result is an affirmative response or a negative response, where the response is displayed on a terminal.

9. (Original) The system of claim 1 wherein the computer aided process is selected from a library comprising a plurality of processes.

10. (Original) The system of claim 9 wherein the plurality of processes includes at least a comparing process, a contrasting process, and a functional process.

11. (Original) A system for monitoring an industrial process for the manufacture of materials or objects, the system comprising:
an input module, the input module being adapted to input a plurality of process parameters from a process for manufacture of a substance or object;
a library module coupled to the input module, the library module including a plurality of computer aided processes, each of the computer aided processes being

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capable of determining an output based upon a predetermined training set of the plurality
of process parameters;

    an output module coupled to the library module, the output module being
adapted to output a result based upon the predetermined training set and the plurality of
process parameters;

    wherein each of the computer aided processes compares at least two of the
plurality of process parameters against a portion of the training set of parameters and
determines if the at least two of the plurality of process parameters are within a
predetermined range of the portion of the training set of parameters.

    12.   (Original) The system of claim 11 wherein the substance is
selected from a petroleum product, a chemical product, a food product, a health product,
a cleaning product, a biological product, and other fluid or objects.

    13.   (Original) The system of claim 11 wherein the plurality of process
parameters are selected from an intrinsic element or an extrinsic element of the process.

    14.   (Original) The system of claim 11 wherein the input module, the
library module, and the output module are provided in a computer software program.

    15.   (Original) The system of claim 11 wherein the computer aided
process includes an algorithm selected from PCA, HCA, KNN CV KNN Prd, SIMCA
CV, SIMCA Prd, Canon Prd, SCREAM, and Fisher CV.

    16.   (Original) The system of claim 11 wherein the training set of
parameters are preprocessed.

    17.   (Original) The system of claim 11 wherein the process parameters
comprise at least olfactory information.

18.   (Original) The system of claim 11 wherein the result is an affirmative response or a negative response, where the response is displayed on a terminal.

19.   (Original) The system of claim 11 wherein the library module comprises a plurality of processes.

20.   (Original) The system of claim 19 wherein the plurality of processes includes at least a comparing process, a contrasting process, and a functional process.

21.   (Original) A system for controlling a process, the system comprising:

a first field mounted device in communication with a process and configured to produce a first input; and

process manager receiving the first input and configured to apply a first model to the first input to identify a first predicted descriptor characteristic of a state of the process, and configured to consult a first knowledge based system to provide an output based upon the first predicted descriptor.

22.   (Original) The system of claim 21 wherein the process manager is a server in communication with the first field mounted device via a computer network.

23.   (Original) The product of claim 21 wherein the process manager is a server in communication with a user through a network of computers utilizing a browser software program.

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24. (Original) The product of claim 23 wherein the process manager is in communication with the first field mounted device via the computer network.

25. (Original) The system of claim 21 further comprising a second field mounted device receiving the output and adjusting an operational parameter of the process according to the output.

26. (Original) The system of claim 21 further comprising an output module including an interface between the process manager and an associated system including at least one of a legacy system, an e-enterprise system, and a desktop application.

27. (Original) The system of claim 21 wherein the first knowledge based system is an expert system.

28. (Original) The system of claim 21 wherein the model is constructed utilizing one of a univariate statistical technique, a multivariate statistical technique, a time series analysis, and a neural-based technique.

29. (Original) The system of claim 21 further comprising a library configured to store one of a group of different algorithms utilized to construct the first model.

30. (Original) The system of claim 21 further comprising a library configured to store one of a group of different algorithms utilized to construct the first model.

31. (Original) The system of claim 21 further comprising a second model, the process manager configured to apply the second model to the data to identify a

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second predicted descriptor characteristic of the process data, the process manager further configured to produce the output based upon the first predicted descriptor and the second predicted descriptor.

32. (Original) The system of claim 21 further comprising:

a second model; and

a second knowledge based system, the process manager applying the second model to the data to identify a second predicted descriptor characteristic of the process data, the second knowledge based system submitting one of the first predicted descriptor and the second predicted descriptor to the first knowledge based system where the first predicted descriptor is different from the second predicted descriptor.

33. (New) A monitoring system comprising:

a plurality of field mounted devices configured to detect characteristics reflecting an environmental condition;

a processor in communication with the plurality of field mounted devices and configured to receive the detected characteristics;
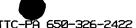
a plurality of data sources in communication with the processor over a network, the plurality of data sources storing data relevant to the environmental condition; and

a computer aided process module coupled to the processor, the computer aided process module being adapted to compare the detected characteristics with the data stored by the plurality of data sources; and

an output module coupled to the processor, the output module being adapted to generate an output based upon comparison of the detected characteristics with the stored data.

34. (New) The system of claim 33 wherein said plurality of field mounted devices includes at least one of a chemical sensor, a radiation sensor, and a biological sensor.

35. (New) The system of claim 34 wherein said chemical sensor is configured to produce a response in the presence of a chemical stimulus selected from the group consisting of a vapor, a gas, a liquid, a solid, an odor or mixtures thereof.

36. (New) The system of claim 35 wherein said chemical sensor is selected from the group consisting of a conducting/nonconducting regions sensor, a SAW sensor, a quartz microbalance sensor, a conductive composite sensor, a chemiresistor, a metal oxide gas sensor, an organic gas sensor, a MOSFET, a piezoelectric device, an infrared sensor, a sintered metal oxide sensor, a Pd-gate MOSFET, a metal FET structure, a electrochemical cell, a conducting polymer sensor, a catalytic gas sensor, an organic semiconducting gas sensor, a solid electrolyte gas sensors, and a piezoelectric quartz crystal sensor.

37. (New) The system of claim 34 wherein said radiation sensor is configured to produce a response in the presence of a stimulus selected from the group consisting of gamma rays, X-rays, ultra-violet rays, visible radiation, infrared, microwaves, and radio waves.

38. (New) The system of claim 34 wherein said biological sensor is configured to produce a response based upon the presence of an organism or a biochemical molecule.

39. (New) The system of claim 33 wherein the plurality of data sources are selected from the group consisting of a database, an algorithm, a model, and a knowledge based system.

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40. (New) The system of claim 39 wherein the data comprises characteristics detected at a previous time or in a different location.

41. (New) The system of claim 39 wherein the data comprises a result from a model or algorithm having the detected characteristics as input.

42. (New) The system of claim 39 wherein the knowledge based system is selected from the group consisting of an expert system, a self-learning system, a logic system, and a fuzzy variant of the same.

43. (New) The system of claim 33 further comprising a model generation module for generating a model of a phenomenon.

44. (New) The system of claim 43 wherein said model generation module generates a model derived from an event producing at least one of chemical, biological, and radiation stimuli in the environment.

45. (New) The system of claim 33 further comprising a diagnostic module identifying an event producing at least one of a chemical, biological, and radiation stimulus.

46. (New) The system of claim 33 wherein the output comprises notification regarding occurrence of an event.

47. (New) The system of claim 46 further comprising a module for initiating follow-on actions upon occurrence of the event.

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48.　(New)　The system of claim 46 further comprising a communication module for communicating the output to alert a human monitor.

49.　(New)　The system of claim 48 wherein the communication module includes a server storing the output for access by a user through a browser software program.

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50.　(New)　The system of claim 33 further comprising an associated system in communication with the processor over a network. the associated system including at least one of a legacy system, an e-enterprise system, and a desktop application.

51.　(New)　The system of claim 33 further comprising a preprocessing module configured to modify the detected conditions.

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